

Café Biologique: Bridging the student-professional gap

JOSEF HUNTINGTON, BSC BIOLOGICAL SCIENCES STUDENT

Third Year BSc students at the Royal Veterinary College (RVC) have set up an initiative called Café Biologique to bridge the gap between students at the College and professionals. But who are they, what have they done and what are they aiming for?

During their studies at the RVC, Josef Huntington, Annabelle Loustric, Kirstie Lucas and Mahnoor Khan noticed a sizable gap in career communication at the College other than that geared towards veterinary or postgraduate veterinary study. So, with the support of Charlotte Lawson (Course Leader), Sophie Pullen (Educational Development), Morag Walling (Careers) and

Janette Pickles (LBIC Operations Manager), Café Biologique was born to inspire students to explore careers other than Veterinary Medicine.

The initiative is to create an informal, friendly networking environment. With a maximum of 30 students, two or three main speakers and some additional professionals, students feel comfortable to

Continued on page 3.

WELCOME

Bioscience is certainly an interesting field. In this issue we feature some amazing innovations, including a computer language for programming biology (page 5) and a test that can not only detect the target infection but also indicate whether the infection would respond to antibiotic treatment (page 6).

It is no wonder that students wish to pursue careers in bioscience, but with the diverse paths that the sector has to offer, it can be hard to know where to start. At the Royal Veterinary College, one group took matters into their own hands and founded Café Biologique in order to start a dialogue between students and leading scientific figures. This is a vital first step in nurturing the next generation of science professionals, and on page four we hear about ways that companies might host a student in a mutually beneficial arrangement.

Lucy Garnsworthy, Editor

In this issue:

- Bridging the student-professional gap** Lead story
- Deubiquitinase drug discovery** Page 3
- Antha platform for bioengineering** Page 5
- New osteoporosis treatment** Page 7

LBIC Virtual Client Offer

- Access to meeting rooms and catering*
- Mail handling*
- Discounted courier bookings
- Call forwarding
- Networking opportunities and complimentary one-year Gold membership of One Nucleus

Contact Janette Pickles jpickles@rvc.ac.uk

*Additional charges apply

£600
for the first six months



Client News Round-up

Unibio to increase food production with Nigerian and Danish projects

Unibio will form a Joint Venture Company with the Nigerian National Petroleum Corporation (NNPC), with 10% equity financing guaranteed by the Danish government. The new company will utilise Unibio's technology and Nigeria's abundant natural gas resources to convert methane into protein, producing animal feed for a market worth N800billion (£1.68 billion) per year.

This venture is part of NNPC's commitment to non-oil projects and the company hopes that the initiative will create income, jobs and food security for the country.

Unibio will also form part of Innovation Fund Denmark's DKK14.78 million (£1.76 million) PROVIDE project. The five-year PROVIDE project will see key institutions from academia and industry developing methods to identify and extract useable proteins from by-products of existing food production processes in order to create new food additives.



Unibio CEO Henrik Busch-Larsen and process engineer Patrick Pedersen at Unibio's demonstration plant in Kalundborg, Denmark

LBIC welcomes these new clients to the Centre:

- Haoma Medica
- iGEM Therapeutics
- Science Developments
- Smart Surgical
- Virokine



Industrial spray system using Fabrican technology

Fabrican opens the door to mass customisation

Like 3D printing for fabrics, Fabrican's Spray-on fabric coating conforms to any shape, enabling producers to vary products' physical properties (shape, size, texture, or colour) to suit each customer's specification, without the need for re-tooling or stocking different grades of material.

A single robotic sprayer and PLC (programme logic controller) can manufacture multiple products with different characteristics with adjustments to the liquid fibre solution or reprogramming. Replacing many machines with one robotic sprayer offers an efficient solution for small businesses, and for producers in less developed countries, while automating existing manual processes could save labour costs and reduce reliance on overseas component suppliers. Compressing the industrial supply chain and eliminating excess inventory and warehousing requirements can reduce costs even further. Spray-on fabric technology also offers significant environmental benefits: closed-loop manufacturing processes can recycle up to 99% of solvents by a system of adsorption, desorption, condensation, and filtration. The fabric products themselves can be recycled after use, while increased local production and reduced reliance on overseas-sourced materials will reduce carbon emissions from container shipping.

Alkol a finalist for Global Energy Awards

Sustainable feedstock developer Alkol Biotech has been selected as a finalist in the prestigious Platts Global Energy Awards 2017, described as "the Oscars of energy". Alkol Biotech has been nominated for the "Industry Leadership Award – Bioenergy". Platts receives more than 200 nominations each year from more than 25 countries, and the judges are eminent energy figures from industry and academia.

Alkol CEO Al Costa commented: "Being side by side with companies the size of DuPont and UPM can only be achieved when you truly have something unique. In this sense, our EUnenergyCane sugarcane variety is the key... Being the only sugarcane variety suited to the European climate, it is increasingly being seen as the best feedstock solution for the production of a large number of fuels, plastics, and chemical products which today come from oil."

Domainex-Auspherix collaboration

Domainex's collaboration with Auspherix has produced encouraging data in the development of a novel class of drugs to overcome antibiotic-resistant infections.

The joint project has identified three chemical series with broad-spectrum antibacterial properties. The Auspherix 'organogold' compounds (containing gold molecules) are active against the ESKAPE bacterial pathogens. Known to cause the majority of antimicrobial infections in hospitals, the ESKAPE group comprises *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Enterobacter*.

A notable existing organogold compound is auranofin, used in the FDA-approved anti-rheumatic drug Ridaura. Auspherix hopes the Domainex collaboration will eventually lead to human clinical trials in 2019, focusing on treatment of complicated urinary tract infections (cUTI).

Continued from front page

ask questions and engage one-to-one, building their networking skills and creating a student-professional network that both parties can utilise in the future. All speakers are based within the biology field, showing students where their BSc in a biology-related subject can take them. Over the past year, Café Biologique has hosted a wide array of events focusing on potential careers, from the Zoological Society of London (ZSL) for science communication to BUGS Bioscience for Biotechnology start-up and entrepreneurial expertise. The initiative has been incredibly well received and has had great success over the past year, with increasing attendance at events and external speaker recruitment, with the

year ending in receiving generous funding from LBIC to develop the enterprise further.

Now, that is the history, what are Café Biologique planning on achieving this year? The funding is going into marketing Café Biologique, creating a solid grounding for students to carry on the initiative in the coming years. Alongside this, they are setting up the RVC's first BSc Third Year Dissertation Conference and Poster afternoon, to showcase the quality of research that students undertake at the RVC, providing them with presentation experience and the chance to meet potential employers. In addition, they want to increase the access students have to the entrepreneurial community and the accompanying expertise. With LBIC just

next door providing the perfect platform for students to come and engage with successful biotechnology companies and hone their skills, Café Biologique aims to provide a means for students to grow their own ideas and enhance their business skills: after all, we are in the era of the biotech!

Confirmed speakers for the coming year include the World Health Organisation Collaborating Centre for Reference and Research on Influenza and CRUK Therapeutic Discovery Laboratories, proving the sky is the limit for this initiative and the growing reach of Café Biologique.

If you are interested in contacting Café Biologique to find out more, please email: cafebiologique@rvc.ac.uk.

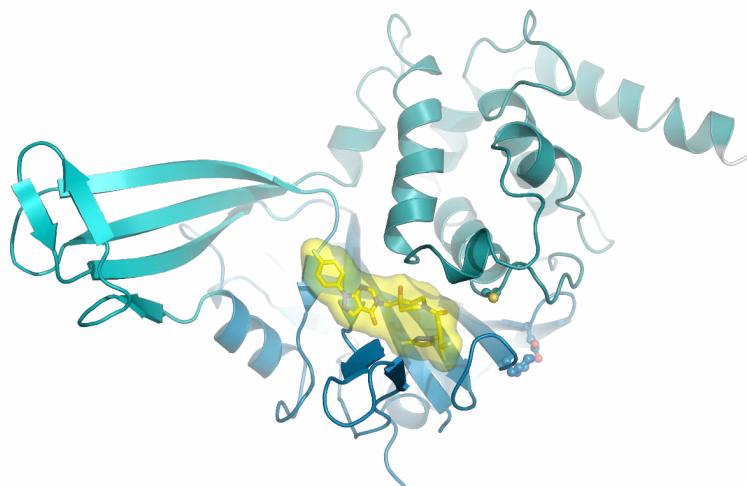
New structural insights accelerate deubiquitinase drug discovery

A unique Industry-Academia Alliance led by the CRUK Therapeutic Discovery Laboratories (CRUK-TDL) based at LBIC and the Babraham Research Campus, Cambridge, and FORMA Therapeutics in the US, which encompasses four academic centres, has focused on the development of highly specific deubiquitinase (DUB) small-molecule inhibitors. A high-value target for the Alliance, ubiquitin specific protease 7 (USP7) controls the stability of the E3 ligase MDM2, which is reflected in changes of its substrate, the tumour suppressor p53. USP7 inhibition can restore p53 levels and block tumorigenesis, and therefore represents an attractive target for the development of anti-cancer agents.

In a landmark study, which represents a new strategy for targeting otherwise challenging oncology targets, the Alliance has successfully developed a series of novel, potent and selective USP7 inhibitors using structure-based design. These inhibitors specifically bind within the

catalytic domain to the unique auto-inhibited apo-form state of USP7 explaining their exquisite selectivity. The inhibitors attenuate the DUB activity of USP7 leading to an increase in p53 levels and retardation of tumour growth in a mouse xenograft model. This work has recently been

published in Nature and provides a proof-of-principle example that specific DUB inhibitors can be generated (Turnbull *et al.* 2017 Nature **550** 481–486).



X-ray crystal structure of the USP7 catalytic domain in complex with the small-molecule inhibitor, FT671, highlighted in yellow.

Charlotte Lawson

Dr Charlotte Lawson is the Course Director for the Royal Veterinary College's Biosciences degrees, both undergraduate and post-graduate, as well as a Senior Lecturer in the Cardiovascular and Inflammation research group. Charlotte studied Animal Science before undertaking a PhD studying rheumatoid arthritis, followed by post-doctoral research and a fellowship funded by the British Heart Foundation in her main research focus of vascular inflammation.

Part of Charlotte's role as Course Director is to help RVC students to plan their careers and become career-ready, which can include facilitating work placements or publicising part-time roles at relevant companies.

What sort of student opportunities are there?

BSc students can do a formal one-year placement, either between their second and third years, or after their third year with the intention of undertaking a Masters afterwards. The pre-Masters placements tend to have a research focus, but placements do not have to be at a typical research institution, or doing stereotypical research roles 'playing with pipettes'. A number of undergraduate students hope to do postgraduate studies in scientific communication, marketing or outreach – for them, a small biotech where everyone 'mucks in' could be ideal.

There is also the option of taking on a student for a shorter work experience role, or a part-time job, which can offer more flexibility than a formal year-long placement.

What does a company gain by offering a student a part-time role?

There may be a specific fixed-term project for which an employer needs an extra pair of hands, or a role that their existing team does not have the resources to fulfil, particularly in small companies. A short-term arrangement initially could help a company see what a student is capable of without committing to anything further.

A lot of students nowadays are already doing extracurricular activities that give them transferable skills that can be very useful to an employer, such as blog writing and online communication.

How does working with a company benefit a student?

If a student plans to get a part-time job anyway, it is much better to be in a scientific company than a retail role, for example. From identifying potential clients by conducting market research to assisting with cleaning protocols or handling deliveries, simply being in a relevant work environment can have enormous benefit for a student. I myself had a part-time student job at a Biological Services Unit at Mill Hill, which gave me a valuable understanding of how a BSU works.

Why is it important for students to work with companies?

We want to make sure students are career-ready, or at least ready for the start of their career, because people do not stay in the same role as much any more. It is important that they get opportunities to explore different avenues.

RVC students are pretty well-prepared for working life by our careers service, but placements or part-time work add another dimension. For students to be able to say

they have been in a real lab setting or a real workplace setting gets them ahead of the pack, and helps them make decisions about what they want to do. There is as much benefit to crossing things off the list as putting things on the list. That is not to say that they were not good at it, but having tried it for a year, they know they do not want to do it any more.

How can companies get involved?

In terms of placements, my colleagues and I can assist employers in getting those set up, and help with ticking various boxes along the way, to make sure both the employer and the student are happy.

For part-time roles, I can have a chat to a company to find out what they want and then I would post their job advert on the RVC's employability hub. After that, the recruitment process is left entirely between the employer and student; I do not tell people who to hire.

To discuss student opportunities further, please contact Charlotte at chlawson@rvc.ac.uk



Synthace raises £7.3m to accelerate biotechnology to enable faster breakthroughs

ZOE FREEMAN, HEAD OF OPERATIONS, SYNTHACE

At LBIC, just up the road from the Crick Institute and Google, Synthace's multidisciplinary team of wet-lab biologists, data scientists and software engineers are working together to develop Antha, a cloud-based software platform and operating system that enables the design, planning and automated execution of experimental biology protocols and processes using labs' existing equipment.

In September 2017, the company announced the successful raise of a further £7.3m in venture capital funding. Synthace will use this latest investment to expand their software and wet-lab teams, aiming to grow from around 25 to over 40 employees in the next 12 months. This investment in the team will expand sales and marketing and support the ongoing development of the Antha platform, including writing Antha drivers for a growing range of lab instrumentation and equipment from multiple manufacturers.

Rolling out Antha

Antha is already in use by clients such as MSD, GSK, Dow Agrosiences and new

entrants into the biology arena including Microsoft. At the recent BioProcess International conference in Boston, USA, Synthace and MSD presented the first results of Antha rollout for the rapid and robust construction of a wide range of vectors for bioprocess optimisation. Throughput was increased by an order of magnitude and enabled an estimated 25% reduction in vector construction timelines, a 33% reduction in costs, and dramatically reduced manual steps. This enabled the rapid investigation of large arrays of genetic options alongside process factors for full bioprocess optimisation.

Over the summer, Synthace also announced partnerships including with

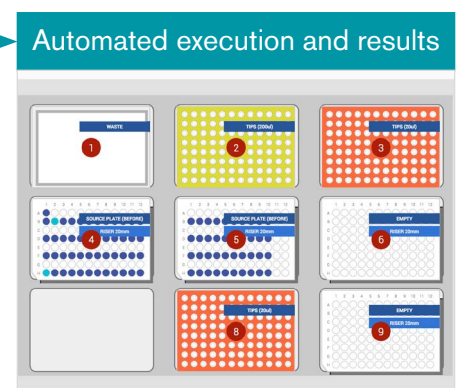
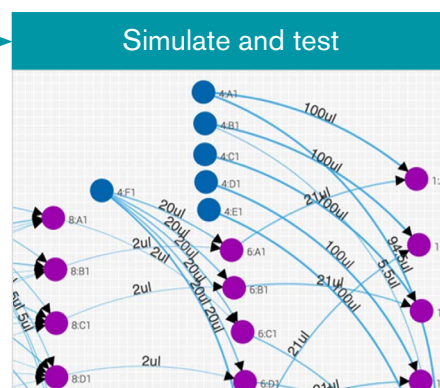
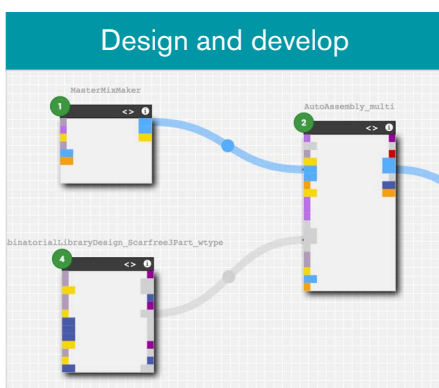
"Bioengineering and its implications for the future depend upon achieving step-change improvements in reproducibility, productivity and cost, all of which the Antha platform can deliver"

Hermann Hauser, Co-Founder and Partner at Amadeus Capital Partners

product design and development firm Cambridge Consultants, and an Innovate UK-supported collaboration with Oxford BioMedica, the Cell and Gene Therapy Catapult and Stratophase exploring a next generation manufacturing platform for gene and cell therapies.

Biology is not an engineering discipline – yet! Synthace has set its sights on bringing engineering approaches, automation and machine learning to biology, empowering researchers to accelerate biotechnology and enable faster breakthroughs.

To find out more, visit synthace.com and follow @synthace. For more information about careers at Synthace, visit: synthace.com/join-us



Antha's end-to-end digitisation of biology means that protocols are digitally encoded, making optimised lab methods unambiguous, reproducible and immediately shareable between colleagues.

A Quick Guide to Media Training

BY MARIA PATEY,
SCIAD COMMUNICATIONS

The UK is at the heart of world-class bioscience research, with an increasing number of entrepreneurial, forward-thinking and future-focused people collaborating to create companies that deliver solutions to some of the major issues facing world health and society today.

Preparing to speak to the media is often very low on the list of priorities. It can feel easy to talk in 'science speak' to fellow colleagues and industry peers about how a revolutionary technology works, and where it could be applied, but it's not so easy to communicate 'why' it matters and channel this to external stakeholders who should know about it.

For many people in discovery and R&D, speaking with media is not something they ever envisaged themselves doing, let alone considered training for. I mean, how hard can it be? It's not rocket science (unlike the stuff that's being tested in the lab), or so many people often think. Surely everyone will want to know about the company and its technology, as the discoveries are amazing! Right....?

Success with the media is not quite as straightforward or as simple as one might imagine. If you want your stakeholders to be aware of, understand and engage with your business, then you need to demonstrate value. Often, business leaders

and executives are apprehensive about responding to media enquiries, so here are a few top tips to help you prepare for, and embrace, the OPPORTUNITY of a meeting with media.

Top tips

- Make sure you understand your story (define your key messages and refine how you deliver them)
- Understand 'who' you're speaking to
 - Which publication? (who are the readers, what is the circulation/reach?)
 - The title/role of the journalist, their style and what they've covered in the past
- Be clear on exactly why you are speaking with them (or vice versa)
- Be accessible (don't ignore the calls or emails!)
- Think soundbites: Less is more – be clear, concise and to the point with your answers
- Start with the end in mind! Remember, the journalist doesn't need (nor do they want) the full history; they want to know WHY it matters, WHO it affects and HOW it works
- Avoid jargon
- Numbers often result in headings or headlines. If you have a fact that you can support with a number or statistic – use it
- Help the journalist's understanding: Offer anecdotes and examples where possible
- 'No Comment' and 'Off the record' are not an option
- Be true to your word: Don't promise anything you can't deliver
- If faced with a difficult or challenging question – acknowledge, don't dismiss
- Avoid coming across as judgmental or defensive
- Remember, a lot can be read from your body language!

Finally, don't underestimate the power of PR!

SpeedX secures funding and expands distribution for leading STI test

Australian molecular diagnostics company SpeedX has been working to expand the distribution of its ResistancePlus MG test, which detects the sexually transmitted

infection (STI) *Mycoplasma genitalium*. The company received CE marking for the diagnostic in September 2016 and has signed deals with Cepheid and Diagen to facilitate distribution in key European markets. SpeedX was recently awarded a A\$2.5 million (US\$2 million) grant from the New South Wales Medical Devices Fund (MDF), which will support US clinical trials with the ultimate aim of securing US Food and Drug Administration (FDA) clearance of the test in order to access the US market. A strategic partnership with Thermo Fisher Scientific will allow SpeedX to validate ResistancePlus MG for use on the Applied Biosystems 7500 Fast Dx Real-Time-PCR system prior to submission for FDA approval.

ResistancePlus MG detects *M. genitalium* and identifies markers that indicate resistance to the macrolide antibiotic azithromycin (commonly used to treat a number of STIs). *M. genitalium* was first discovered in 1981, and a 2015 UK study indicated the infection is present in over 1% of adults aged 16-44. Symptoms may include urethritis and pelvic inflammatory disease, but the infection is often asymptomatic, making accurate testing of vital importance. Including a macrolide resistance test alongside the initial diagnosis could be key in determining an effective treatment plan, because recent studies identified resistance in up to 50% of *M. genitalium* positive patients and resistance is thought to be increasing.



Terry Sutherland and Warwick Need exhibiting at the STI & HIV World Congress in Brazil

Haoma secure patent for potential new osteoporosis treatment

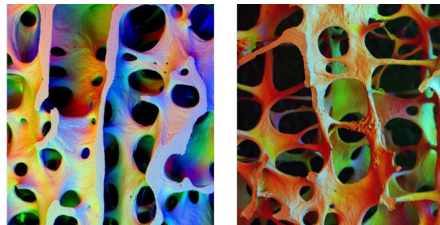


Haoma Medica Ltd is a UK based biotech company that focuses on treatments for osteoporosis and osteopenia as well as blood clotting management. Its lead agent, NaQuinate, is a new class of drug for the treatment of osteoporosis.

Osteoporosis is a disease that leads to increased bone fragility and fracture rate. It is a major burden on healthcare systems affecting one in three women and one in five men over 50 and the occurrence of fracture is associated with a marked increase in morbidity and mortality. The impact of this disease is only set to become greater as its prevalence increases with an aging population.

NaQuinate is a naturally occurring metabolite of vitamin K that is found in the body at negligible levels under normal dietary conditions. However, when vitamin K

is administered at levels much greater than would be obtainable through diet, appreciable amounts of NaQuinate can be detected. High dose vitamin K therapy has been shown to reduce the rate of fracture



Healthy bone *Osteoporotic bone*
Electron micrographs supplied by Professor Alan Boyde

incidence in clinical trials leading to the suggestion that conversion to NaQuinate confers a benefit to skeletal integrity.

Professors Andrew Pitsillides and Stephen Hodges have been researching and developing NaQuinate for several years at the Royal Veterinary College leading to the demonstration of the proof-of-principle

efficacy research, showing both a preservation of bone mass and retention of bone architecture, in a "gold standard" pharmaceutical model of oestrogen-deficiency bone loss.

Having secured multi-regional patent protection for NaQuinate, together with substantial financial investment, Haoma Medica Ltd is currently expanding its preclinical research profile, including funding further studies at the RVC and Tromsø University Hospital, prior to the submission of an application to initiate a phase I clinical trial in healthy volunteers in 2018.

For further information please see our website www.haomamedica.com, or contact us directly carmen.greco@haomamedica.com.

Introduction to...

GammaDelta Therapeutics Ltd

GammaDelta Therapeutics Ltd has been founded on pioneering research into gamma delta ($\gamma\delta$) T cells led by Professor Adrian Hayday and Dr Oliver Nussbaumer at King's College London and the Francis Crick Institute, funded in part by Cancer Research UK. The company was established in 2016 with seed financing from Abingworth LLC and subsequently entered into a strategic partnership with Takeda Pharmaceuticals Company Limited in May 2017.

$\gamma\delta$ T cells are lymphocytes that, along with B cells and alpha beta T cells, form part of our adaptive immune system. This tripartite system is evolutionarily conserved across species all the way from jawless fish to humans, thus underscoring its importance in maintaining effective immunity. They have unique properties that enable them to combine the specificity of an adaptive immune response with the speed of an innate cellular response. In contrast to alpha beta T cells, $\gamma\delta$ T cells do not rely on

specific antigen-driven activation and instead are able to recognise molecular patterns of dysregulation in infected or transformed cells, giving them the potential to work in a range of diseases and to be used in an allogeneic context.

Whereas most research on $\gamma\delta$ T cells has been focussed on those resident in blood, tissue-resident $\gamma\delta$ T cells represent a compelling new approach as these cells reside and carry out immune surveillance within tissues. However, their residency in



tissues has made them hard to study and even harder to isolate and grow in a laboratory or clinical setting. GammaDelta Therapeutics has developed unique methods to enable the isolation and expansion of these cells, for the first time allowing them to be grown in large numbers so their behaviour can be studied in normal and disease settings. As a result, they now have a compelling opportunity to fully exploit their capabilities towards clinical exploration.

GammaDelta Therapeutics has a team of experienced management (led by Paolo Paoletti), a strong academic pedigree and is focussed on developing effective treatments for patients suffering from cancer and other serious diseases.

More information on GammaDelta Therapeutics can be found at www.gammadeltatx.com.

New rare diseases group

Rare Innovations was established as an independent not-for-profit company in 2017 to support emerging rare diseases innovations and solutions and accelerate their route to market.

Rare Innovations will work with existing stakeholders and advocates within the wider rare disease value chain to enhance, and not duplicate, the support available to solution providers and help them realise the full potential of their innovations.

Beginning with the launch event Accelerating Rare Disease Innovations to

Market on 12 December 2017 (part of the One Nucleus 2017 Genesis fringe programme), Rare Innovations will organise a series of training events to provide knowledge and networks to accelerate rare disease innovations to market. These events will bring together rare disease innovation solution providers and key actors within the wider rare disease value chain to learn how innovations in diagnostics, therapeutics and medical technology can find the right collaborators, clients and funders.

www.rareinnovations.org.uk

Contact us

LBIC has been supporting life sciences companies since 2001. Today we host more than 60 companies, ranging from entrepreneurial start-ups to more established UK companies and overseas subsidiaries from Europe, North America and Asia Pacific. The Centre is owned



and operated by the prestigious Royal Veterinary College, one of the independent Colleges of the University of London.

The Centre is a 10-minute walk from St Pancras International for Eurostar services and the site of The Francis Crick Institute.

Our management team comprises:

Dr Ken Larkin
Chief Executive

Janette Pickles
Operations Manager

Lucy Garnsworthy
Communications Manager

For further information, or to enquire about our services, contact:

The London BioScience Innovation Centre,
2 Royal College Street,
London, NW1 0NH

Tel: +44 (0) 20 7691 1122

Email: lbic@rvc.ac.uk

www: www.lbic.com

Twitter: @LBICLondon

LinkedIn: [linkedin.com/company/london-bioscience-innovation-centre](https://www.linkedin.com/company/london-bioscience-innovation-centre)

Rare diseases

KEY FACTS

- The EU defines a rare disease as affecting less than 1 in 2000 of the general population. In the USA, a rare disease is one affecting fewer than 200,000 people at one time in that country.
- 80% of rare diseases have a genetic source, and they are frequently chronic and life-threatening.
- Over 6000 distinct rare diseases have been identified, although the majority of patients are affected by one of around 350 diseases.
- 75% of rare diseases affect children, and 30% of patients die before the age of five.
- There are only around 400 licensed treatments for rare diseases currently on the market, leaving millions of patients without effective treatment.
- Rare Disease Day takes place at the end of February each year to raise awareness of rare diseases.

Would you like to feature in our newsletter?

If you would like to contribute to a future issue of LBIC News, contact **Lucy Garnsworthy** on +44 (0) 20 7691 0982 or email lgarnsworthy@rvc.ac.uk



London BioScience
Innovation Centre

WHERE ENTERPRISE COMES TO SUCCEED

Scan the QR code
for instant access
to our website

